## **Investment Section**



## **2016 COMPREHENSIVE ANNUAL FINANCIAL REPORT**For the Fiscal Year Ended June 30, 2016

IIII III		
IIANA PUBLIC RETIREMENT SYSTEM		
	113	Report on Investment Act

116 Report from the Chief Investment Officer **Contribution Plan** 123 **Outline of Investment Policies Investment Summary** 

#### **Investment Results - Consolidated Defined Benefit Assets**

126	Assets by Retirement Plan
127	Asset Allocation Summary: June 30,
	2016 Actual vs. June 30, 2015 Actual
128	Asset Allocation Summary: June 30,
	2016 Actual vs. Target
129	Annualized Time-Weighted Rate
	of Return by Asset Class vs.
	Benchmark Returns
130	Asset Class Summaries
138	Historical Comparative Investment
	Results
139	Ten-Year Time-Weighted Investment
	Rates of Return
140	Statistical Performance

## **Investment Results - Annuity Savings Accounts and Legislators' Defined**

141	Assets by Investment Option
142	Historical Annualized Time-Weighted
	Rate of Return by Investment Option
	vs. Benchmark Returns
143	Annuity Savings Accounts Ten-Year
	Guaranteed Fund Interest
	Crediting Rates

#### **Investment Information**

144	Largest Assets Held as of
	June 30, 2016
145	Top Ten Brokers' Commission Fees
145	Investment Management Fees
146	Investment Professionals

#### Report on Investment Activities



August 8, 2016

**Board of Trustees** Indiana Public Retirement System One North Capitol Avenue Indianapolis, IN 46204

#### Dear Trustees:

As Indiana Public Retirement System's (INPRS) general consultant, Verus Advisory is pleased to provide the Board of Trustees with an overview of the market environment for the fiscal year ended June 30, 2016 as well as an update on performance and a summary of recent developments.

#### **Investment Landscape**

The 2016 fiscal year was marked by continued challenges in the global economy and capital markets; where continued volatility in equity, energy, and currency markets prompted central banks globally to foster low and even negative interest rate policies.

The U.S. continued its moderate recovery during fiscal year 2016 with real GDP growth of 2.1 percent (as of March 31st) year over year, positive but below the long-term trend. Headline inflation was 1.0 percent during the period. Our research suggests that the current cycle, while above average in terms of duration, has resulted in lower cumulative economic growth than most prior cycles. The labor market in the U.S. continues to improve with headline U-3 unemployment at 4.9 percent as of June 30, 2016; the participation rate declines of the last several years appear to have stabilized.

The fiscal year began with concerns over an economic slowdown in China and continued pressure on energy markets causing broadly negative sentiment across risk markets. INPRS was not immune to this sell-off, and this market downturn cost the portfolio approximately 4.0 percent during the third quarter of 2015.

In the fourth quarter of 2015, disinflationary pressures continued globally prompting the European Central Bank to push deposit rates further into negative territory. The U.S. dollar appreciated to its highest level since 2003 relative to a trade weighted basket of currencies. The most notable event in markets was the Federal Reserve raising the fed funds rate for the first time since the Global Financial Crisis, creating a notable divergence in central bank policies between the U.S. and other developed markets.

#### Report on Investment Activities, continued

The first quarter of 2016 witnessed a precipitous drop in equity markets as recessionary fears escalated. With the Federal Reserve offering more dovish commentary, oil prices finding a bottom, and economic stimulus propping up China's economy, markets quickly stabilized and re-traced new highs, with emerging markets seeing a particularly significant recovery.

The second quarter of 2016 ended with Brexit where the U.K. voted to leave the EU catching the market by surprise. Brexit led to a short-term market sell-off followed by most markets snapping back relatively quickly. More impactful to performance for INPRS has been interest rates continued move lower; as of June 30, 2016 approximately one third of all global government bonds were trading with a negative yield, more than \$10 trillion in market value. Two of the largest sovereign bond markets outside the U.S., German and Japanese yield curves had negative yields out to the 15 year tenor.

#### Plan Performance<sup>1</sup>

The INPRS investment portfolio ("the Portfolio") earned a 1.2 percent return net of fees for the fiscal year ending June 30, 2016. This return trailed the policy index return by 20 basis points and the long-term actuarial assumed return, of 6.75 percent, by 5.6 percent. However, INPRS' one-year return did exceed the median of a public funds universe<sup>2</sup> which earned 0.8 percent.

As previously discussed, the largest driver of returns during the fiscal year was depreciation in global public equities (which in turn was largely driven by a strengthening U.S. dollar) and weaker commodity markets offset by lower interest rates driving bond prices higher. On an absolute basis, exposure to global private equity, global fixed income, real estate and risk parity were positive, while investments in public equity, commodities, and hedge funds were negative.

The Portfolio's investments in private equity, global fixed income and risk parity exceeded their respective composite benchmarks. Private equity returned 6.8 percent on a time-weighted basis, exceeding the public market equivalent benchmark (Russell 3000 + 3.0 percent) by 1.7 percent; being overweight in this asset class was additive to returns. Inflation-linked bonds returned 5.4 percent and exceeded the benchmark by 10 basis points. Risk parity strategies generated returns of 1.7 percent, outperforming the composite's custom benchmark by 90 basis points.

Global public equity strategies fell 4.3 percent over the period, the broad market index fell 3.9 percent. The nominal fixed income portfolio returned 8.9 percent, trailing its benchmark by 0.4 percent. Despite a 14 percent return in commodities for the first six months of 2016, the fiscal year return was (19.6) percent, trailing the benchmark by 1.2 percent. Real estate strategies generated returns of 8.1 percent trailing its benchmark by 4.5 percent over the fiscal year while absolute return lost 2.9 percent.

<sup>1</sup>Rates of return are net of fees and based on calculations made by the System's custodian, Bank of New York Mellon, and are presented using a time weighted rate of return methodology based upon market value.

<sup>2</sup>Bank of New York Mellon Universe of Public Funds

#### Report on Investment Activities, continued

On a longer term basis, the portfolio has generated 4.8 percent annually over the last three years and 4.2 percent over the last five years. Consistent with the INPRS' goal of minimizing investment risk, the realized standard deviation of the program has averaged less than 6.0 percent for the last five years.

#### **Plan Activity**

After a 2015 fiscal year that focused on ensuring the asset allocation was aligned with the enterprise objectives (completed through an asset-liability study), during 2016 Verus worked with INPRS staff on a number of strategic initiatives designed to maximize the overall efficiency of the portfolio. This included implementation of a cash securitization strategy which should improve realized returns and decrease the operational burdens associated with liquidity management. Verus has also worked with staff on evaluating the merits of internalizing certain investment management functions in an effort to reduce the fees paid to third-party investment managers and further improve the in-house intellectual capital. A comprehensive study regarding the appropriateness of investment management fees has also been conducted. Verus and INPRS staff have undertaken analyses focused on revisiting the role of commodities in the context of the current disinflationary cycle. The collaboration on this effort has provided additional insight relative to the risk exposure within the portfolio, including how risk is defined from a liquidity perspective and how INPRS can utilize measurement of risk factors in the portfolio rebalancing process.

All of us here at Verus appreciate the opportunity to assist in meeting the investment objectives set forth by the INPRS Board. We are confident in the direction of the portfolio given the INPRS' demographics and fiscal strength. We look forward to continuing our partnership as we navigate ever-changing capital markets.

Sincerely,

Jeffrey J. MacLean Chief Executive Officer

they Man Ler

#### Report from the Chief Investment Officer

#### INPRS' Investment Imperatives<sup>1</sup>

Established in fiscal year 2012, three long-term imperatives that are vital to the continued health of the System's defined benefit plans have served as the guide for the investment staff. Every strategic, tactical, and operational decision that is made must have the expectation of positively contributing to at least one of these imperatives.

- 1. Achieve the long-term rate of return assumption. Effective fiscal year 2013, INPRS' Board set the long-term rate of return assumption at 6.75 percent, and again last fiscal year, the Board reaffirmed 6.75 percent as the appropriate long-term assumption. In order for the System to maintain a healthy funded status, it is essential to achieve this rate of return over the long-term (defined as 10+ years in INPRS' Investment Policy Statement).
- Accomplish the first imperative as effectively and efficiently as possible. While it is important to establish an
  asset allocation that is expected to meet the target rate of return over a long time horizon, as fiduciaries, it is also
  important to maintain focus on maximizing the return per unit of risk, limiting return volatility, and maximizing cost
  efficiency.
- 3. Maintain enough liquidity to make retirement payments on time. As the System matures, retirement payments will be a greater cash outflow each year. As a result, it is critical to maintain an appropriate level of liquidity to ensure payments are made on time and without causing undue stress to the investment portfolio.

#### Putting the Year in Perspective<sup>2</sup>

The consolidated defined benefit assets returned 1.2 percent net of all fees over the past fiscal year and ended with a market value of \$24.8 billion. Fiscal year 2016 was a continuation of the low return environment of the prior year as well as increased volatility across asset classes. This was the second straight year that U.S. public equities experienced an intra-year sell-off greater than 10.0 percent, which had not happened in the three years prior. Not to mention, commodities finished the year down over 18.0 percent. Defying consensus views from market participants though, longer-dated U.S. Treasury bonds had another banner year with a return greater than 16.0 percent. This combination of difficult to anticipate events, in addition to many others not mentioned, continued to strengthen our belief in the importance of diversification and the avoidance of a concentration in any one asset class.

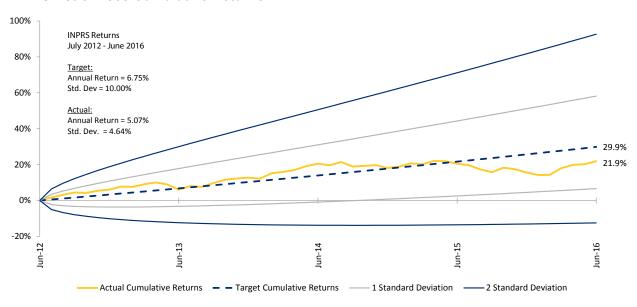
The path toward reducing INPRS' concentration in equities started in fiscal year 2012. Based on extensive research of the various asset classes and their performance in different economic environments through time, it was determined that a new risk-balanced framework better fit our first two imperatives. Developed from that research, the following chart illustrates the projected range of outcomes for INPRS' asset allocation around the 6.75 percent return target (dotted line). This visual is meant to track the cumulative performance of the actual portfolio (solid line) versus those expectations along the way. Although the portfolio has underperformed the return target since adopting the new asset allocation strategy in 2012, the cumulative return is well within our range of expected outcomes.

<sup>&</sup>lt;sup>1</sup>For more detail, see the INPRS' Investment Policy Statement, Section 4 – Guiding Principles.

<sup>2</sup>Rates of return specific to INPRS' portfolio are based on calculations made by the System's custodian, Bank of New York Mellon, and are presented using a time-weighted rate of return methodology based upon market value.

Report from the Chief Investment Officer, continued

#### **INPRS Net of Fees Cumulative Returns**



The following table shows INPRS' annual net-of-fees returns over the same time period. Since inception of the revised strategy, the portfolio has generated an annual return of 5.0 percent above the return of cash and outperformed the average historical spread for the asset allocation over cash (4.5 percent)3.

#### **INPRS Annual Returns (Net of Fees)**

	Excess Return	+	Cash Return	=	Total Return
FY2016	1.0 %		0.2 %		1.2 %
FY2015	0.0		0.0		0.0
FY2014	13.6		0.1		13.7
FY2013	5.9		0.1		6.0
INPRS Annual Return	5.0		0.1		5.1
Avg. Annual Return of INPRS Target Asset Allocation (since 1937) <sup>4</sup>	4.5		3.6		8.1

The prior charts highlight the near-term challenges resulting from today's low interest rate (and cash return) environment as the Plan's total performance has fallen short of the target rate of return assumption of 6.75 percent since 2012. However, the target rate of return was established based on a much longer time horizon. As such, the asset allocation that was constructed to meet the return objective will ultimately be measured over decades rather than years.

<sup>3</sup>A portfolio's return in excess of cash is also known as the risk premium. Cash return based on three-month LIBOR (source: the System's custodian, Bank of New York

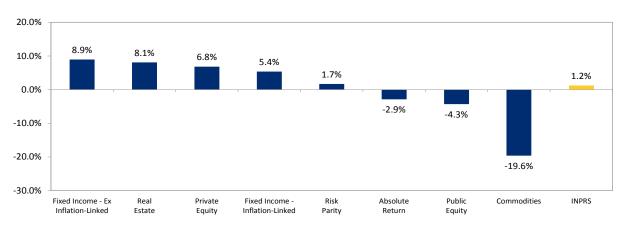
<sup>&</sup>lt;sup>4</sup>Excess return presented by INPRS' general consultant, Verus, at the June 2015 INPRS Board meeting. INPRS' current target asset allocation was approximated historically using available indices. Cash return based on the one-month US Treasury bill return from 1937 - 2015 (source: Dimensional Fund Advisors' Matrix Book 2016 of Historical Returns Data).

#### Report from the Chief Investment Officer, continued

#### **Performance Attribution**

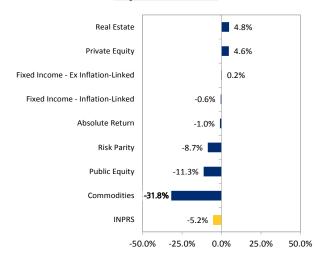
Looking closer at fiscal year 2016, a majority of asset classes had positive returns, while asset classes that tend to perform poorly when growth is lower than expected – public equities and commodities – struggled. Real estate and private equity continued to post strong returns net of all fees, albeit on a lagged basis.<sup>5</sup> More specifically, INPRS' separate asset classes and actual asset allocation generated the following returns:

#### For the Year Ended June 30, 2016

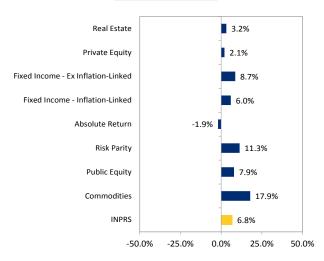


The chart above does not tell the full story, though, as there was a reversal in performance mid-year. The turning point occurred in February 2016 as broad-based underperformance in the first seven months of the fiscal year threatened the pace of improving global growth and, thus, caused the Federal Reserve and other global central banks to reconsider raising interest rates or tightening policy any further. As a result, performance in the final five months of the fiscal year was much improved, led by commodities and fixed income.<sup>6</sup>

July 2015 - Jan 2016



#### Feb 2016 - Jun 2016



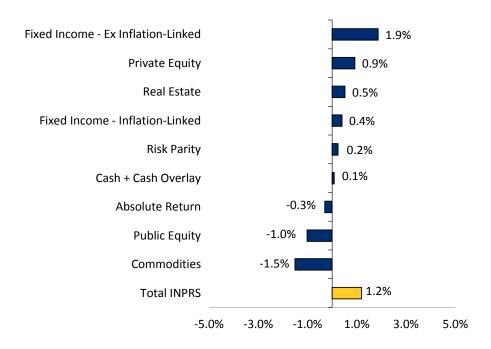
<sup>&</sup>lt;sup>5</sup>Real estate and private equity performance is lagged one quarter due to the timing of valuations.

Although it was the second best performer from February to June, risk parity was not mentioned because it is a diversified allocation of equities, fixed income, and commodities.

#### Report from the Chief Investment Officer, continued

The following chart takes into account the weight of each asset class in the portfolio as well as its return over the past year. By linking these components, we are able to observe the contribution to total return that each asset class provided. This view serves as a better representation of performance given that our risk-balanced strategy produces an allocation that invests less in more volatile asset classes (e.g. commodities) and more in less volatile asset classes (e.g. fixed income).

#### Fiscal YTD Contribution to Total Return (As of 6/30/16)

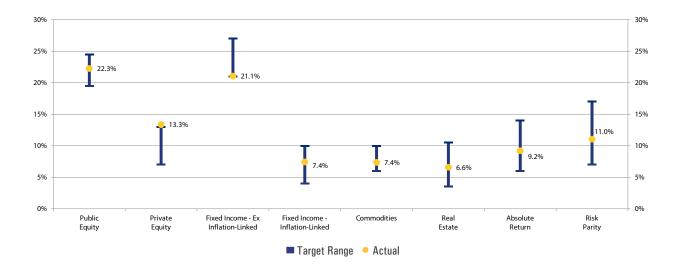


In fiscal year 2016, INPRS experienced a return that was 0.2 percent below its target asset allocation benchmark, net of all fees. The benchmark is meant to reflect what performance would have been had the portfolio been at target weights in each asset class the entire year and invested in passive strategies. The tactical asset allocation decisions made by the team this year produced a slight value-add. On the other hand, the public asset classes lagged their respective benchmarks resulting in an underperformance of 0.3 percent, which more than offset the positive contributions from tactical asset allocation decisions. Despite the underperformance relative to the overall benchmark this year, INPRS' portfolio has produced approximately \$188 million in added value over a portfolio of merely passive investments (asset allocation + manager selection) since reaching the revised asset allocation in July 2012.

#### Reflections from the Past Four Years

As previously mentioned, the System set out on a course seeking more balance across economic and market environments starting in fiscal year 2012 with the approval of a new asset allocation strategy. Despite slight revisions to the asset allocation during last year's asset-liability study that resulted in a marginally higher expected return and return-risk ratio, the outcome reaffirmed the path of diversification INPRS had previously chosen and continues to pursue. As such, INPRS prudently moved toward the new target allocations over the course of fiscal year 2016. The allocation as of June 30, 2016 can be found in the chart on the following page.

#### Report from the Chief Investment Officer, continued



The allocation may look different than one that merely targets a return without regard for risk; however, INPRS has sought a more diversified approach to strategic asset allocation based on two fundamental linkages between employer contributions and investment returns within the consolidated defined benefit plan:

- 1. Employer contributions become more volatile as investment performance is more volatile. The more return volatility the portfolio experiences the less predictable and stable the contribution requirements will be for employers. As a result, it is critical for the portfolio to minimize drawdowns as much as possible while trying to target a 6.75 percent rate of return.
- 2. Employers' fiscal health and traditional investment portfolios (e.g. 60 percent equities and 40 percent bonds) are generally biased toward environments where growth is better than expected. The income growth that fuels the tax base for INPRS' employers is frequently a result of higher economic growth. A traditional portfolio is also highly dependent on the rate of growth given that equities largely determine its performance. Consequently, it may be advantageous to reduce the correlation of the investment performance to economic growth so that both the portfolio and employers are not going through rough patches at the same time.

Although the last four years have been less volatile than what we have observed in markets over a longer history<sup>7</sup>, there have been a few smaller sell-offs in equity markets that are worth analyzing. These mini case studies (defined as months where global equities declined by more than 2.5 percent) serve as helpful observations as we continually evaluate the effectiveness of the portfolio in reducing the pain of equity drawdowns. So far, the results have met our original objectives. INPRS has outperformed a traditional 60 percent equity and 40 percent bond portfolio in five of the six cases with a 37 percent smaller drawdown on average (-1.6 percent vs. -2.6 percent) as illustrated in the following charts.<sup>8</sup>

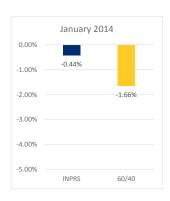
<sup>&</sup>lt;sup>7</sup>Going back to 1926, March 2009 through June 2016 is the second longest run without a decline of 20 percent or more for the S&P 500 Index. Source: J.P.Morgan Guide to the Markets, July 31, 2016.

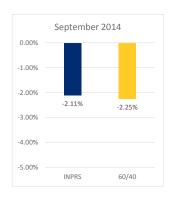
Equities and bonds have been represented by the MSCI ACWI imi Index and the Barclays Global Aggregate Index, respectively. Source: the INPRS' custodian, Bank of New York Mellon.

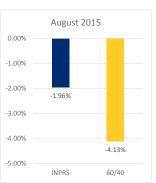
#### Report from the Chief Investment Officer, continued

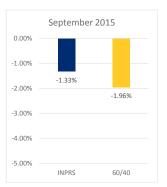
#### Equity Drawdowns: INPRS vs 60/40 Portfolio













While there is still work to be done to ensure future equity drawdowns do not have damaging effects on the portfolio and thus employer contributions, analysis of the first real-time examples we have observed leave us encouraged that we have headed down the appropriate path.

#### **Focus on Continual Improvement**

There has been an evolution in culture over the past five years as the INPRS investment team has conscientiously focused more attention on risk management across each function of the investment process. This shift has resulted in enhancements to our portfolio risk reporting, fee reporting, external investment manager diligence, and compliance function to name a few. The focus on continual improvement was no different in fiscal year 2016 as the team completed projects associated with fee management and liquidity.

Related to the second investment imperative, effectiveness and efficiency, INPRS continued to negotiate fees and cut costs where possible. As a resource to use in these efforts going forward, INPRS participated in a public pension fee study conducted by CEM Benchmarking. The benchmarking study compared the cost of INPRS' asset allocation and subsequent performance to CEM's extensive database of similar-sized public pension plans. After neutralizing for differences in asset allocation across plans, CEM reported that INPRS' annual investment fees were lower than the average peer plan.9 While it is important for the team to remain vigilant in minimizing fees, the ultimate barometer of success will be performance net of all fees. Examining the benefit from fees paid over the past five years, CEM reported that INPRS' outperformance over its passive benchmark (0.3 percent annually net of all fees) was in the top half of the peer universe.

<sup>&</sup>lt;sup>9</sup>INPRS' fees were 0.02% lower than the average peer plan. Report as of December 31, 2014.

#### Report from the Chief Investment Officer, continued

Focusing on the third investment imperative, liquidity, INPRS continues to strive for greater precision in determining the optimal amount of liquid assets to keep on-hand while minimizing the performance drag from low cash returns. A good example in fiscal year 2016 was the implementation of a cash overlay program. The securities used to construct the overlay attempt to match INPRS' target asset allocation as closely as possible while enabling us to maintain a similar cash profile. Inside and outside of the overlay portfolio, INPRS is positioned to deliver adequate liquidity for retirement payments. As of June 30, 2016, INPRS estimates 30 percent of the Consolidated Defined Benefit Assets could be liquidated in one week, 68 percent of the portfolio could be liquidated within one month, and 78 percent of the portfolio could be liquidated within six months without a significant market impact.

#### **Looking Forward**

I have found my first six years at INPRS, first as Director of Public Equity and then Deputy CIO, to be greatly fulfilling. Now as CIO, I will continue to maintain focus on ensuring that INPRS achieves its imperatives over the coming years and decades. While the current environment may make it difficult to achieve the return component in the near-term, I have confidence in the strong culture and team we have at INPRS. This foundation allows me to be optimistic over the long-term that we can meet each of the imperatives outlined above.

Scott B. Davis, CFA

Chief Investment Officer

#### **Outline of Investment Policies**

he Indiana Public Retirement System's ("INPRS") Board of Trustees ("Board") serves as the ultimate fiduciary of INPRS. Indiana Code, Article 5-10.5 provides that a nine-member Board of Trustees will oversee INPRS. The nine trustees shall be appointed by the Governor, four of whom must be members of INPRS. The INPRS Board of Trustees appoints the executive director of INPRS.

The Board establishes investment policies; however, Indiana law establishes guidelines on the investment of the Fund's assets. At all times, INPRS must invest its assets in accordance with the "Prudent Investor" standard. Under this standard, investment decisions are based upon the same degree of care that a prudent person acting in a like capacity and familiar with such matters would use in the conduct of an enterprise of a similar character with similar aims.

The objective of the Board's Investment Policy Statement ("IPS") is to maintain adequate funding for each retirement fund and pension system in order to provide for the payment of such fund's actuarially determined liabilities over time in a cost-effective manner. The purpose of the IPS is to support this general objective by:

- Setting forth the investment policies which the Board judges to be appropriate and prudent, in consideration of the needs and legal requirements applicable to direct investment of the assets;
- Making a clear distinction between the roles and responsibilities of the Board, Staff, and each Service Provider;
- Establishing formalized criteria to measure, monitor and evaluate the performance results of the Investment Managers;
- Communicating the investment policies, objectives, guidelines, and performance criteria of the Board to the Staff, Investment Managers, Consultants, Service Providers, employers, members and all other interested parties; and
- Serving as a review document to guide the ongoing oversight of the investments by the System and demonstrating that the Board is fulfilling its fiduciary responsibilities in the administration and management of each Retirement Fund's assets solely in the interests of such Retirement Fund's members and beneficiaries.

The Board intends for the IPS to be a dynamic document, and, as such, expects to conduct periodic reviews utilizing input from INPRS staff, consultants and other knowledgeable parties. The Board anticipates approving changes from time to time to reflect changes in any or all of: economic and market conditions, investment opportunities, the System's investment strategy, benefit provisions, and the INPRS's governance.

The Board recognizes that the allocation of assets is the most important determinant of investment rates of returns over long periods of time. The procedure for determining the allocation will consider the relevant characteristics of the liabilities and the potential assets of the Fund. An asset liability study will be conducted no less than every three years and will analyze the expected returns of various asset classes, projected liabilities, risks associated with alternative asset mix strategies and their effect on the projected market value of assets, funded status, and contributions to the Fund.

With a long-term investment focus, the portfolio is invested across the following asset classes: Public Equity, Private Equity, Fixed Income - Ex Inflation-Linked, Fixed Income - Inflation-Linked, Commodities, Real Estate, Absolute Return, and Risk Parity. The current asset allocation, approved by the Board on October 23, 2015 is as follows:

#### Outline of Investment Policies, continued

INPRS Asset Allocation:	Target Allocation	Target Range	Benchmark		
Public Equity	22.0 %	19.5 to 24.5 %	MSCI All Country World		
Private Equity	10.0	7.0 to 13.0	Russell 3000 + 300bps		
Fixed Income – Ex Inflation-Linked	24.0	21.0 to 27.0	Custom Benchmark		
Fixed Income – Inflation-Linked	7.0	4.0 to 10.0	Custom Benchmark		
Commodities	8.0	6.0 to 10.0	Custom Benchmark		
Real Estate	7.0	3.5 to 10.5	NCREIF NFI-ODCE		
Absolute Return	10.0	6.0 to 14.0	HFRI Fund of Funds Composite		
Risk Parity	12.0	7.0 to 17.0	Custom Benchmark		
Fixed Income – Ex Inflation-Linked Fixed Income – Inflation-Linked Commodities Real Estate Absolute Return	24.0 7.0 8.0 7.0 10.0	21.0 to 27.0 4.0 to 10.0 6.0 to 10.0 3.5 to 10.5 6.0 to 14.0	Custom Benchmark Custom Benchmark Custom Benchmark NCREIF NFI-ODCE HFRI Fund of Funds Composit		

The Board employs investment managers to implement the asset allocation through a selective and thorough search process that embodies the principles of procedural due diligence. It is the intent of the Board to encourage the participation of all qualified organizations in this process. The Board encourages investment managers to develop long-term investment strategies consistent with the guidelines outlined in the IPS, as well as governing Indiana statutes. Additionally, investment managers will adhere to and comply with the CFA Institute Global Investment Performance Standards in calculating and reporting investment performance. Performance of each manager is measured against the rate of return associated with appropriate market index benchmarks and an appropriate universe or style peer group of investment managers.

Annuity Savings Accounts (ASA) are accounts established for each member of the Public Employees' Retirement Fund and the Teachers' Retirement Fund (Pre-1996 Account and 1996 Account). A member's account is credited with the legislated 3 percent mandatory contribution (either paid by the member or the employer). The member has investment direction to several alternative funds or may direct contributions to the Guaranteed Fund. The ASA produces an additional separate benefit from the fixed-formula employer funded pension benefit to the member. The ASA investment options currently include:

- 1. Large Cap Equity Index Fund;
- 2. Small/Mid Cap Equity Fund;
- 3. International Equity Fund;
- 4. Fixed Income Fund;
- 5. Inflation Linked Fixed Income Fund;
- Target-Date Retirement Funds;
- 7. Money Market Fund;
- 8. Stable Value Fund (PERF ASA Only & Legislators' Plan only);
- 9. Consolidated Defined Benefit Assets (Legislators' Plan only);
- 10. Guaranteed Fund

The Guaranteed Fund provides a guarantee of the value of an individual's contributions plus any interest credited. The INPRS Board of Trustees annually establishes the interest crediting rate for the Guaranteed Fund based on a uniform methodology. The interest crediting rate for the Guaranteed Fund during the last 10 years is included in the Investment Highlights of this section.

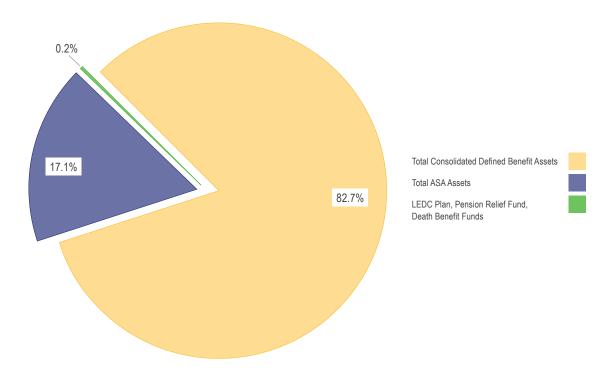
The number and types of investment funds offered will be periodically reviewed by the Board in order to ensure diversity of investment alternatives, adequate and reasonable availability of investment types, and clarity and usefulness of the investment choices. ASA performance data is included in the Investment Highlights of this section.

Fund Fact Sheets for the aforementioned ASA investment options, are available online at: <a href="http://www.in.gov/inprs/fundfactsheets.htm">http://www.in.gov/inprs/fundfactsheets.htm</a>

#### **Investment Summary** As of June 30, 2016

(dollars in millions)		Actual Assets	Percent
Consolidated Defined Benefit Assets:	-		
Defined Benefit Retirement Plans' Assets	\$	24,766.6	82.7 %
Legislators' Defined Contribution Plan (LEDC Plan) <sup>1</sup>		9.0	-
Total Consolidated Defined Benefit Assets		24,775.6	82.7
Annuity Savings Accounts (ASA) Assets <sup>2</sup> :			
Public Employees' Retirement Fund (PERF)		2,613.1	8.7
Teachers' Retirement Fund Pre-1996 Account (TRF Pre-1996)		1,277.5	4.3
Teachers' Retirement Fund 1996 Account (TRF 1996)		1,217.8	4.1
Total Annuity Savings Accounts Assets		5,108.4	17.1
Legislators' Defined Contribution Plan <sup>3</sup>		19.0	0.1
Pension Relief Fund⁴		26.9	0.1
Death Benefit Funds <sup>5</sup>		14.6	
Total Investments <sup>6</sup>	\$	29,944.5	100.0 %

¹Assets represent members of the LEDC Plan who have elected the Consolidated Defined Benefit Assets option.
²ASA assets are directed by PERF, TRF Pre-1996 and TRF 1996 members outside the Consolidated Defined Benefit Assets.
³Account balances directed outside the Legislators' Consolidated Defined Benefit Assets option.
⁴Assets are invested in a Money Market Fund with Bank of New York Mellon.
⁵Includes State Employees' Death Benefit Fund and Public Safety Officers' Special Death Benefit Fund.
⁵Includes Investment Receivables, Foreign Exchange Contracts Receivables, Interest and Dividend Receivables, Securities Lending Collateral, Investment Payables, Foreign Exchange Contracts Payables, Securities Lending Obligations, and Obligations Under Reverse Repurchase Agreements.

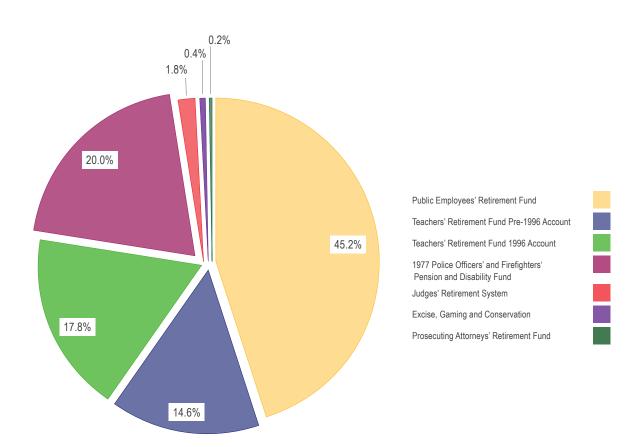


#### Assets by Retirement Plan As of June 30, 2016

#### (dollars in millions)

Retirement Plan	1	Amount	Percent
Public Employees' Retirement Fund	\$	11,198.7	45.2 %
Teachers' Retirement Fund Pre-1996 Account		3,609.4	14.6
Teachers' Retirement Fund 1996 Account		4,399.8	17.8
1977 Police Officers' and Firefighters' Pension and Disability Fund		4,950.0	20.0
Judges' Retirement System		441.7	1.8
State Excise Police, Gaming Agent, Gaming Control Officer, and Conservation Enforcement Officers' Retirement Plan		111.3	0.4
Prosecuting Attorneys' Retirement Fund		52.8	0.2
Legislators' Retirement System - Defined Benefit Plan		2.9	-
Legislators' Retirement System - Defined Contribution Plan		9.0	
Total Consolidated Defined Benefit Assets <sup>1</sup>	\$	24,775.6	100.0 %

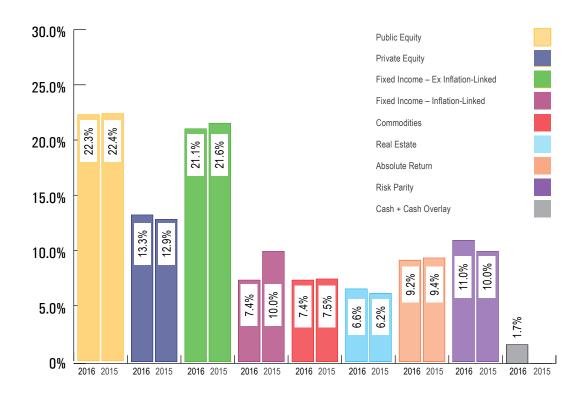
<sup>1</sup>Includes Investment Receivables, Foreign Exchange Contracts Receivables, Interest and Dividend Receivables, Securities Lending Collateral, Investment Payables, Foreign Exchange Contracts Payables, Securities Lending Obligations, and Obligations Under Reverse Repurchase Agreements.



Asset Allocation Summary: June 30, 2016 Actual vs. June 30, 2015 Actual

(dollars in millions)		June 3	0, 2016		June 30	, 2015	
Asset Class	Amount		Percent	Amount		Percent	
Public Equity	\$	5,511.8	22.3 %	\$	5,521.0	22.4 %	
Private Equity		3,304.5	13.3		3,181.0	12.9	
Fixed Income – Ex Inflation-Linked <sup>1</sup>		5,216.4	21.1		5,335.7	21.6	
Fixed Income – Inflation-Linked		1,838.0	7.4		2,455.9	10.0	
Commodities		1,822.0	7.4		1,850.5	7.5	
Real Estate		1,629.8	6.6		1,518.9	6.2	
Absolute Return		2,279.0	9.2		2,309.3	9.4	
Risk Parity		2,736.4	11.0		2,457.5	10.0	
Cash + Cash Overlay		437.7	1.7				
Total Consolidated Defined Benefit Assets <sup>2</sup>	\$ 2	24,775.6	100.0 %	\$	24,629.8	100.0 %	

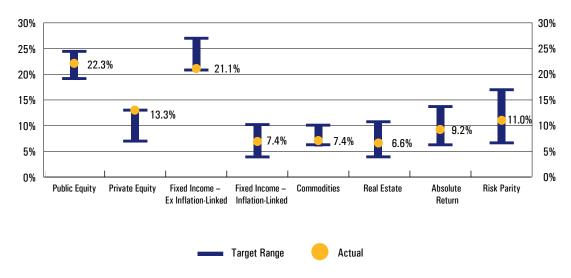
<sup>&</sup>lt;sup>1</sup>Includes cash & cash equivalents for fiscal year ended June 30, 2015 only.
<sup>2</sup>Amounts disclosed above will agree to the Pooled Unit Trust Investments in the Financial Section in Note 2 (H) Summary of Significant Accounting Policies. The amounts disclosed above are shown by investment strategy and will differ from the Statement of Net Position and the Summary of Investments Held in the Financial Section Note 3 (D) Cash and Investments, due to the investment strategy disclosure being related to a systematic plan to achieve returns and diversification and the Summary of Investments Held disclosure summarized by 1) the legal structure of the investments and 2) excluding Investment Receivables, Foreign Exchange Contracts Receivables, Interest and Dividend Receivables, Securities Lending Collateral, Investment Payables, Foreign Exchange Contracts Payables, Securities Lending Obligations, and Obligations Under Reverse Repurchase Agreements.



#### Asset Allocation Summary: June 30, 2016 Actual vs. Target

Asset Class	June 30, 2016 Actual	Target	Allowable Range for Investments
Public Equity	22.3 %	22.0 %	19.5 to 24.5 %
Private Equity	13.3	10.0	7.0 to 13.0
Fixed Income – Ex Inflation-Linked	21.1	24.0	21.0 to 27.0
Fixed Income – Inflation-Linked	7.4	7.0	4.0 to 10.0
Commodities	7.4	8.0	6.0 to 10.0
Real Estate	6.6	7.0	3.5 to 10.5
Absolute Return	9.2	10.0	6.0 to 14.0
Risk Parity	11.0	12.0	7.0 to 17.0
Cash + Cash Overlay <sup>1</sup>	1.7	N/A	
Total Consolidated Defined Benefit Assets	100.0 %	100.0 %	

Includes cash, cash equivalents, and cash overlay. INPRS does not have a target allocation to cash as an asset class.



Note: Cash + Cash Overlay is not represented in the above chart as INPRS does not have a target allocation to cash as an asset class.

#### Annualized Time-Weighted Rate of Return by Asset Class vs. Benchmark Returns For the Year Ended June 30, 2016

1-Year<sup>1</sup>

Asset Class	Actual Return <sup>2</sup>	Benchmark Return <sup>2</sup>	Actual Over / (Under) Benchmark	Benchmark
Public Equity	(4.3) %	(3.9) %	(0.4)	MSCI All Country World IMI Index (MSCI ACWI)
Private Equity	6.8	5.1	1.7	Russell 3000 Index Plus 300 Basis Points
Fixed Income - Ex Inflation-Linked	8.9	9.3	(0.4)	Custom Benchmark <sup>3</sup>
Fixed Income - Inflation-Linked	5.4	5.3	0.1	Custom Benchmark <sup>4</sup>
Commodities	(19.6)	(18.4)	(1.2)	Custom Benchmark⁵
Real Estate	8.1	12.6	(4.5)	NCREIF Open End Diversified Core Equity Index (ODCE)
Absolute Return	(2.9)	(1.4)	(1.5)	HFRI Custom Benchmark <sup>6</sup>
Risk Parity	1.7	0.8	0.9	Custom Benchmark <sup>7</sup>
Cash + Cash Overlay	5.9	4.2	1.7	Custom Benchmark <sup>8</sup>
Total Consolidated Defined Benefit Assets	1.2	1.4	(0.2)	Custom Benchmark

<sup>&</sup>lt;sup>1</sup>Based on calculations made by the System's custodian, Bank of New York Mellon. Time-weighted rates of return have been reported for fiscal year 2016.

<sup>&</sup>lt;sup>3</sup>Benchmark represents the sub-asset class target allocation within the fixed income portfolio over time.

<sup>&</sup>lt;sup>4</sup>Global Inflation 70/30 is a 70% weight to Global Inflation-Linked Bonds (including U.S.) and a 30% weight to U.S. Inflation-Linked Bonds.

<sup>50%</sup> Bloomberg Commodity Index / 50% Goldman Sachs Commodity Index and a collateral component is a 75/25 blend of Global Inflation Linked Bonds (ILBs) and 90-day Treasury Bills respectively.

<sup>&</sup>lt;sup>6</sup>Weighted average of INPRS' exposure to representative HFRI sub-strategy indices.

<sup>\*\*</sup>Room MSCI ACWI IMI Index (Equities) / 40% Barclays Global Aggregate Bond Index (Bonds).

Benchmark represents the allocation to sub-asset class targets for the cash overlay starting in April 2016; prior to that, the 3-month Treasury Bill was the benchmark for cash.

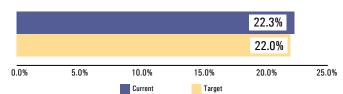
Asset Class Summary: **Public Equity** 

Market Value as of 06/30/2016	INPRS 1-Year Net Performance <sup>1</sup>	MSCI All Country World IMI Index 1-Year Performance
\$5,511.8 Million	(4.3)%	(3.9)%

#### **Portfolio Objective**

The public equity portfolio seeks to provide long-term capital appreciation and income through exposure to public equity securities. INPRS uses a variety of external managers to create a globally diversified portfolio within the asset class. Historically, public equities have performed well in environments when actual economic growth came in higher than expectations and/or when actual inflation came in lower than expectations.

#### INPRS Allocation



#### **Performance Attribution**

INPRS' public equity portfolio had a return of (4.3) percent for fiscal year 2016. The portfolio underperformed the benchmark by 0.4 percent as the underperformance from the domestic portfolio more than offset the outperformance from the international portfolio. The domestic portfolio's underperformance was the result of an overweight to the small cap space and underperformance of large/mid cap active strategies.

#### Market Overview

Global equities, as represented by the MSCI All Country World IMI Index, were down 3.9 percent, over the year. Based on the Russell 3000 Index, domestic equities were up 2.1 percent over the fiscal year, while international equities were down 9.6 percent based on the MSCI ACWI ex US IMI Index.

For the first quarter of the fiscal year, INPRS' global equity portfolio was down 10.0 percent. Global equity markets had a rough quarter mainly driven by concerns about slower growth within the Chinese economy and European Union countries. The Federal Reserve left interest rates unchanged while the European Central Bank indicated it might extend its QE program if needed.

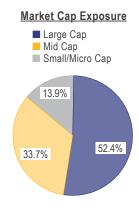
In the second quarter, INPRS' global equity portfolio was up 4.8 percent. Global equity markets generally recovered from the lows of the first quarter as concerns about a Chinese slowdown and geopolitical risks decreased. Energy and emerging markets continued to put downward pressure on the global equity markets.

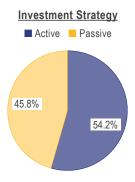
In the third quarter, INPRS' global equity portfolio was up 0.3 percent. While global equity markets had a volatile guarter, beginning calendar year 2016 with a steep loss in January, markets recovered by the end of the quarter as central banks renewed commitments to stimulate growth. Global economic data showed some improvement and oil prices recovered significantly from recent lows.

In the fourth guarter, INPRS' global equity portfolio was up 1.1 percent. Another volatile guarter was the experience in equity markets as Brexit shocked the world at the end of June. Concern over slowing global growth, the future of the European Union, the impact of Brexit, the direction of interest rate, and the price of commodities contributed to increasing volatility in equity markets around the world.

#### **Portfolio Structure**







<sup>&</sup>lt;sup>1</sup>Investment performance is based on calculations made by the system's custodian, Bank of New York Mellon, and are time weighted rates of return

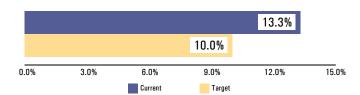
Asset Class Summary: *Private Equity* 

Market Value as of 06/30/2016	INPRS 1-Year Net Performance <sup>1</sup>	Russell 3000 plus 300 basis points 1-Year Performance
\$3,304.5 Million	6.8%	5.1%

#### **Portfolio Objective**

The private equity portfolio seeks to provide risk adjusted returns in excess of the public equity markets while simultaneously decreasing the volatility of the investment portfolio through diversification. The pivate equity portfolio is invested in the following sub-asset classes: venture and growth capital, buyout, energy, and debt related strategies.

#### **INPRS Allocation**



#### **Performance Attribution**

The private equity portfolio returned 6.8 percent for fiscal year 2016, outpacing its benchmark return of 5.1 percent by 1.7 percent. The private equity portfolio also outperformed the Cambridge Associates Pooled IRR for the one year period, 8.9 percent versus 6.3 percent, respectively, and the since inception period, 11.4 percent versus 10.4 percent, respectively.

Secondary interests have led the way for the private equity portfolio returning 14.4 percent inception to date. Venture capital, buyouts, special situations, and Real Assets (energy) all proved to be accretive to the overall plan return generating 12.6 percent, 11.7 percent, 10.1 percent, and 11.1 percent, respectively.

Although the exit environment for private equity was not as consistently strong in fiscal year 2016 as in recent years past, INPRS' private equity portfolio continued to receive positive net cash flows of \$188 million. Distributions during the fiscal year totaled \$750 million and contributions totaled \$546 million.

#### **Portfolio Overview**

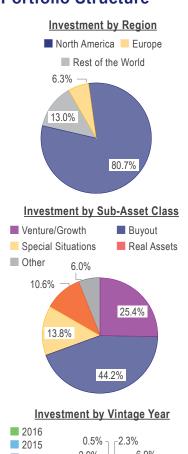
The private equity portfolio continues to maintain a home continent bias with over 80 percent of portfolio net asset value located in North America. Investments are well diversified by sub-asset class with buyout and venture capital / growth accounting for the largest portions of the portfolio at 44 percent and 25 percent, respectively.

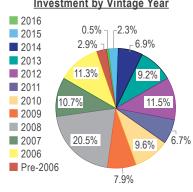
The portfolio continues to mature with only 2.9 percent of net asset value now coming from pre-2006 funds and a weighted average fund age of seven years.

In fiscal year 2016, INPRS invested capital with nine managers across thirteen investments, totaling \$669 million of new commitments. Commitments were made to managers in the buyout, real assets, and special situations sub-asset classes.

<sup>1</sup>Investment performance is based on calculations made by the system's custodian, Bank of New York Mellon, and are time-weighted rates of return.

#### **Portfolio Structure**





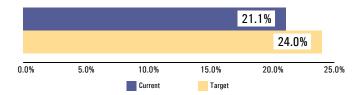
Asset Class Summary: Fixed Income – Ex Inflation-Linked

Market Value as of 6/30/2016	INPRS 1-Year Net Performance <sup>1</sup>	Custom Benchmark <sup>2</sup>	
\$5,216.4 Million	8.9%	9.3%	

#### **Portfolio Objective**

The fixed income portfolio seeks to generate current income and long-term risk-adjusted return in excess of the Custom Benchmark ("Benchmark") through investment in debt securities. A focus is placed on preservation of capital. To minimize the probability of substantial principal loss over the investment horizon, staff first reduce volatility of the portfolio then enhance portfolio return from contractual income and capital appreciation through active management.

#### **INPRS Allocation**



#### **Performance Attribution**

For fiscal year 2016, INPRS fixed income portfolio returned 8.9 percent, underperforming its benchmark by 0.4 percent. Active management within long duration bonds and emerging market debt were the main detractors from performance.

#### **Market Overview**

During fiscal year 2016, investors shifted focus from the U.S. economic recovery and the Fed's dot plot to the negative global economic growth trend and the contagion effect it had on valuation of risk and risk-free assets. Markets experienced several significant shocks: (1) slower than expected Chinese growth, (2) a collapse of commodity prices, (3) trillions of dollars in negative yielding risk-free assets, and (4) Brexit; yet valuations of (both risk and risk-free assets) set all time highs. INPRS' fixed income portfolio benefited from this anomaly but continued its cautious stance.

For the first quarter, uninspiring U.S. growth and labor market prints (e.g. weak participation rate and wage growth) and highly dovish monetary policy in the EU and Japan led to declines in developed market yields. Slower than expected Chinese growth pressured commodities prices and drove spreads significantly wider. INPRS fixed income portfolio returned (0.4) percent with emerging market debt and the opportunistic credit strategy as the main detractors to performance.

For the second quarter, the highly anticipated 0.25 percent Fed rate hike finally materialized in December after 2.5 years of speculation and drove Treasury yields higher. With U.S. dollar at a decade high and continued deceleration of Chinese growth, prices of commodities declined further, spreads widen significantly as credit quality deteriorated, and a number of emerging economies fell further into recession. INPRS fixed income portfolio returned (0.5) percent with long duration Treasury and IG credits, and opportunistic credit strategy as the main detractors to performance.

For the third quarter, continued downward global growth trend and manufacturing overcapacity both acted as dampener on inflation. The lack of inflationary pressure supported the highly dovish monetary policy at global central banks. This dynamic, coupled with the S&P 500 having its worst start to a calendar year ever, tilted the Fed back to being dovish. Global safe haven yields rallied and the U.S. dollar weakened. Drawdown in risk assets was short lived and a full recovery was made by guarter-end. INPRS fixed income portfolio returned 5.1 percent with long duration Treasury and IG credits, and emerging markets debt as the main contributors to performance.

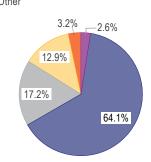
For the fourth quarter, lackluster global growth, suppressed inflation, and market volatility driven by Brexit and missed earnings, dismissed the expectation of a Fed rate hike and continued the commitment on highly dovish monetary policy at global central banks. Global safe haven yields continued to rally, U.S. dollar weakened and several equity markets set all time highs. INPRS fixed income portfolio returned 4.6 percent with emerging markets debt as the main contributor to performance.

#### **Portfolio Overview**

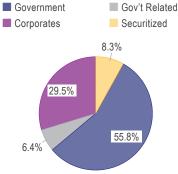
_	INPRS	Benchmark
Duration to worst:	9.5 yrs	9.5 yrs
Yield to worst:	2.8%	2.8%
Credit quality:	A2 / A	A1 / A+

#### Regional Exposure





#### Sector Exposure<sup>3</sup>



<sup>1</sup> Investment performance is based on calculations made by the system's custodian, Bank of New York Mellon, and are time-weighted

Represents sub-asset class target allocations within the fixed income portfolio over time

<sup>&</sup>lt;sup>3</sup>Derivative exposure is included in Government.

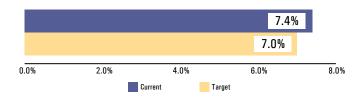
Asset Class Summary: Fixed Income – Inflation-Linked

Market Value	INPRS 1-Year	Custom Benchmark	
as of 6/30/2016	Net Performance <sup>1</sup>	1-Year Performance <sup>2</sup>	
\$1,838.0 Million	5.4%		

#### **Portfolio Objective**

The global inflation-linked bonds ("ILBs") portfolio seeks to generate long-term risk-adjusted return similar to that of the custom global inflation index ("Benchmark"), comprised of 70 percent Barclays Capital U.S. Treasury Inflation Protected Securities (TIPS) Index and 30 percent Barclays Capital Global Inflation-Linked Bond Index, through investment in inflation-linked securities as well as provide protection against unanticipated inflation primarily via passive management.

#### INPRS Allocation



#### **Portfolio Overview**

	INPRS	Benchmark
Duration to worst:	19.6 yrs	19.3 yrs
Yield to worst:	1.9%	0.9%
Credit quality:	Aaa / AA+	Aa1 / AA+

#### **Performance Attribution**

For fiscal year 2016, INPRS global ILBs portfolio returned 5.4 percent, outperforming its benchmark by 0.1 percent. The portfolio's exposure to long duration U.S. TIPS was the main contributor to performance.

#### **Market Overview**

INPRS extended duration significantly in U.S. TIPS and transitioned to its approved target allocation in fiscal year 2016. The portfolio is expected to retain its sensitivity to changes in inflation expectation; however, given its long duration, changes in real rates are expected to influence performance, as well.

During the last twelve months, inflation prints remained near zero in ex-U.S. developed markets despite highly dovish monetary policy at global central banks that resulted in trillions of negative yielding risk-free assets. Inflation prints were within a normal range in the U.S., excluding the effects of food and energy. Lackluster global growth coupled with another collapse in commodity prices kept the risk of an unexpected spike in inflation relatively low but not zero. As an inflation hedge, INPRS' global ILBs portfolio stayed vigilant and kept pace with its benchmark.

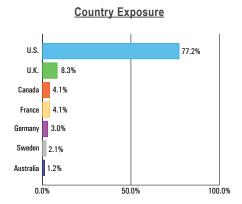
For the first quarter, growth was uninspiring in the U.S. and ex-U.S. developed markets, while slower than expected growth in China pressured prices of commodities and kept inflation prints below expectations and breakeven inflation narrowed considerably. INPRS global ILBs portfolio declined 1.4 percent in the quarter.

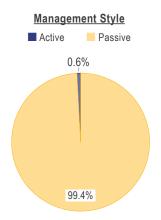
For the second quarter, the highly anticipated 0.25 percent Fed rate hike finally materialized in December after more than two years of speculation and drove real rates higher. Despite inflation prints in the U.S. and ex-U.S. developed markets rising slightly and breakeven inflation widening, INPRS global ILBs portfolio declined 0.7 percent in the quarter.

For the third quarter, a continued downward global growth trend and manufacturing overcapacity both acted as a dampener on inflation. However, benefits of lower commodity prices started to trickle through to end consumers and breakeven inflation widened slightly. This dynamic, coupled with the S&P 500 having its worst start ever to a calendar year, tilted the Fed back to being dovish which resulted in a significant rally of real rates. INPRS global ILBs portfolio returned 4.1 percent in the guarter.

For the fourth quarter, lackluster global growth, suppressed inflation, and market volatility driven by Brexit as well as missed earnings, dismissed the expectation of another Fed rate hike and continued the commitment on highly dovish monetary policy at global central banks. As a result, breakeven inflation declined slightly and real rates rallied significantly. INPRS global ILBs portfolio returned 3.4 percent.

## <sup>1</sup>Investment performance is based on calculations made by the system's custodian, Bank of New York Mellon, and are time weighted





<sup>&</sup>lt;sup>2</sup>Global Inflation 70/30 is a 70% weight to Global Inflation-Linked Bonds (including U.S.) and a 30% weight to U.S. Inflation-Linked Bonds.

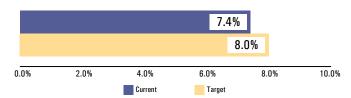
Asset Class Summary: Commodities

Market Value as of 6/30/2016	INPRS 1-Year Net Performance <sup>1</sup>	Custom Benchmark 1-Year Performance <sup>2</sup>	
\$1,822.0 Million	(19.6)%	(18.4)%	

#### **Portfolio Objective**

The purpose of the commodity portfolio is to enhance long-term risk-adjusted returns by preserving investment capital and lowering overall volatility. The portfolio should also act as a hedge against unanticipated inflation. Commodity investments have historically delivered returns that are less correlated with equity and fixed income markets which may provide an opportunity to enhance returns and/or reduce volatility.

#### **INPRS Allocation**



#### **Performance Attribution**

The commodities portfolio one-year total return trailed its benchmark by 1.2 percentage points. Commodities' total return is comprised of two components: 1) commodity futures return and 2) collateral return. The one-year return for each of these components was approximately (21.6) percent and 2.0 percent, respectively.

#### Market Overview

INPRS' commodity exposure is approximately equal to a 50/50 blend of the Bloomberg Commodity Index ("BCOM") and the S&P Goldman Sachs Commodity Index ("GSCI"). For the fiscal year, the two indices returned (13.3) percent and (26.1) percent, respectively.

China reported slower growth for the first guarter, which had a significant impact on commodity prices. The more diversified BCOM fell 14.5 percent during the quarter, its largest quarterly decline since the fourth quarter of 2008. Petroleum markets were hit hardest, with WTI Crude Oil falling nearly 25.0 percent within the quarter.

Commodity markets were mostly down over the first two quarters of fiscal year 2016. Notably, energy, industrial metals, precious metals, livestock, and the agriculture complexes all experienced double-digit declines for the full calendar year of 2015. A number of negative forces weighed on commodity prices during the second quarter of fiscal year 2016, including U.S. dollar strength, deflationary concerns in Europe, and a slowing of the Chinese economy. The BCOM and the GSCI were down 10.6 percent and 16.6 percent, respectively, for the second quarter of fiscal year 2016.

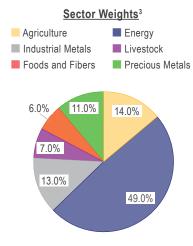
Commodity markets rallied toward the end of the third quarter. Led by the precious metals complex, a small group of commodities, including RBOB gasoline, zinc, gold, silver, soybean oil, and lean hogs, each experienced double-digit price gains to begin calendar year 2016. The BCOM index climbed 0.4 percent while the GSCI index fell 2.5 percent during the period.

The commodity rally late in the third-quarter continued into the fourth quarter, with the BCOM and the GSCI indices increasing 12.8 percent and 12.7 percent, respectively. Crude oil prices gained over 25.0 percent during the quarter, benefiting from strong demand and inventory draws. The largest increases in spot prices, however, were in natural gas and soybean meal. Both commodities were up more than 49.0 percent during the quarter.

<sup>1</sup>Investment Returns are based on calculations made by the system's custodian, Bank of New York Mellon, and are time weighted rates of return.

<sup>2</sup>Custom Benchmark is a 50/50 blend of the Bloomberg Commodity Index and the Goldman Sachs Commodity Index. The collateral component is a 75/25 blend of global inflation-linked bond indices and 90-day Treasury Bills respectively. <sup>3</sup>Approximate.

#### **Portfolio Structure**



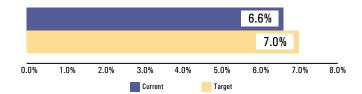
Asset Class Summary: Real Estate

Market Value as of 6/30/2016	INPRS 1-Year Net Performance <sup>1</sup>	Core Equity Index ("ODCE")  1-Year Performance	
\$1,629.8 Million	8.1%	12.6%	

#### **Portfolio Objective**

The real estate portfolio is mostly comprised of investments in private real estate partnerships, and the underlying exposures are a mix of debt and equity holdings. The portfolio seeks to generate attractive risk-adjusted returns by providing stable current income and preserving investment capital. The portfolio should also reduce volatility by providing a hedge against inflation and through the diversification benefits provided by real estate investments.

#### **INPRS Allocation**



#### **Performance Attribution**

For fiscal year 2016, the real estate portfolio trailed its benchmark by 4.5 percentage points. It is important to note that the real estate portfolio will trail its all-equity benchmark during periods of strong equity outperformance relative to debt, as the portfolio is comprised of approximately 35.0 percent commercial real estate debt. The debt portion of the portfolio accounted for nearly all of the relative underperformance with the debt and equity portfolios having returned 2.0 percent and 12.1 percent, respectively, for the period.

#### Market Overview

Capital continued to flow into private real estate during the fiscal year, as evidenced by another year of strong performance. Appreciation was once again the largest contributor to total return. This trend slowed significantly during the year, however, as income exceeded appreciation in the fourth quarter.

For the first quarter, the ODCE returned 3.7 percent. U.S. commercial real estate performed well during the quarter with healthy levels of absorption and continued rental gains as the main drivers. Given the relative attractiveness of U.S. assets, global capital flows remained strong. Across property types, industrial posted the highest return for the guarter, increasing

Despite a preliminary second quarter annualized GDP estimate of 0.7 percent, the final quarter of 2015 witnessed record levels of commercial real estate asset pricing, the highest transaction volume and peak occupancies for the cycle across the office, retail and industrial property types. Performance for the ODCE was up 3.3 percent for the quarter.

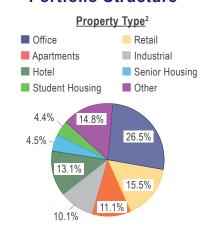
For the third quarter, the ODCE was up 2.2 percent. The U.S. real estate markets continued to achieve favorable results in the third quarter despite a global backdrop of economic uncertainty and capital markets volatility. Retail and industrial were the top-performing property types, both increasing 3.0 percent for the quarter.

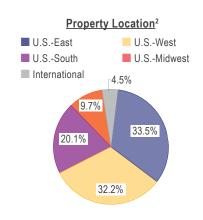
In an otherwise low-yielding market environment, the ODCE finished the year with another relatively strong quarter, up 2.1 percent<sup>3</sup>. In the U.S., industrial led the other major property types with a return of 2.9 percent for the guarter. Retail and apartments also performed well, increasing 2.2 percent and 1.9 percent, respectively.

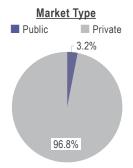
<sup>1</sup>Investment performance is based on calculations made by the system's custodian, Bank of New York Mellon, and are time weighted rates of return.

#### **Portfolio Structure**

NODELE On an End Diversified







<sup>&</sup>lt;sup>3</sup>Based on preliminary results as published by NCREIF.

Asset Class Summary: Absolute Return

Market Value as of 6/30/2016	INPRS 1-Year Net Performance <sup>1</sup>	HFRI Custom Benchmark <sup>2</sup>
\$2,279.0 Million	(2.9)%	(1.4)%

#### **Portfolio Objective**

The purpose of the absolute return strategies program is to enhance the long-term risk adjusted returns of the plan by delivering alpha, providing diversification benefits, and preserving capital. Absolute return strategies generate returns by exploiting mispricing and inefficiencies in global capital markets, while attempting to reduce exposures to primary market factors (e.g. interest rates and equities) through various hedging techniques. These strategies have historically delivered returns with low correlation to traditional long-only investment strategies. It is important to maintain an appropriate level of diversification among investment strategies in order to most effectively meet these stated objectives. At the end of the fiscal year, the absolute return portfolio was comprised of twenty-three managers across twenty-five investments.

#### **INPRS Allocation**



#### Performance Attribution

INPRS underperformed the HFRI Custom benchmark due to a combination of strategy selection and individual manager performance in ex-US equity, event driven, global macro, and structured credit strategies.

#### **Market Overview**

INPRS' absolute return portfolio returned (2.9) percent during fiscal year 2016. The performance trails the return for the custom benchmark.

During the fiscal year, the portfolio was impacted by a combination of market disappointment in central bank decisions, rapid tightening and easing of financial conditions post the China equity/growth scare in Q3 2015, high yield spread widening in Q1 2016, and the immediate market shock from the outcome of the Brexit vote near the end of the fiscal year.

The portfolio's strategies exhibited a wide range of results over the fiscal year, with a range of total returns from -20 percent to +20 percent. The average positive performing investment (twelve in total) had a starting allocation of \$77 million and returned 6.7 percent. The average negative performing investment (thirteen in total) had a starting allocation of \$108 million and returned (10.2) percent over the fiscal year. In summary, the poor performers had lower returns on larger initial allocations than the offsetting positive performers. Despite the challenging alpha performance, the portfolio exhibited very little beta to traditional asset classes over the fiscal year -- 0.1 to the MSCI ACWI, (0.3) to the Barclays Global Aggregate Index, and zero to the S&P GSCI. The average pairwise correlation of fund returns across the entire roster of hedge funds was 0.2, with the maximum average pairwise correlation of any single investment to other fund investments at 0.3.

INPRS' fund-of-funds portfolio, which was an 18.3 percent allocation at the end of the fiscal year, lost 5.0 percent in aggregate over the fiscal year, with wide performance dispersion between the managers. Exposure to energy-related event driven and credit strategies detracted the most from performance, with the greatest positive impact coming from residential mortgages and short-term quantitative strategies.

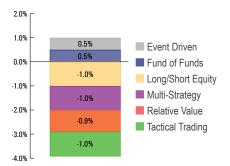
<sup>1</sup>Investment performance is based on calculations made by the systems custodian, Bank of New York Mellon, and are time-weighted rates of return.

<sup>2</sup>HFRI Custom benchmark is a weighted average of INPRS' exposure to representative HRFI sub-strategy

<sup>3</sup>The sum total of sub-strategy returns may differ from the reported portfolio-level return due to rounding at the sub-strategy and portfolio levels.

4May not total 100% due to transition cash balance, allocations as of June 2016.

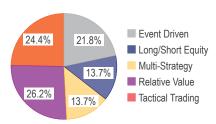
### Contribution to Performance by Strategy<sup>3</sup>



### **Portfolio Composition**



#### Fund of Funds - Look-Through4



Asset Class Summary: Risk Parity

Market Value as of 6/30/201	6/30/2016 Net Performance <sup>1</sup>		Custom Benchmark 1-Year Performance <sup>2</sup>
\$2,736.4 Millio	n	1.7%	0.8%

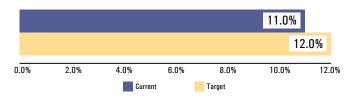
#### **Portfolio Objective**

The risk parity portfolio seeks to create risk balance that is capable of delivering consistent and high risk adjusted returns in several macroeconomic environments. Unlike a traditional asset allocation that is highly dependent on positive equity returns, the risk parity portfolio is constructed to accrue various asset class risk premiums, including equity, without long-term dominance from any single asset class. As a result, the underperformance of a given asset class in a particular environment is expected to be offset by the outperformance of another asset with an opposing sensitivity to the environment.

The risk parity portfolio rests on the following key tenets:

- 1. Over a full market cycle, most asset classes carry a risk premium, and by investing in them, investors expect to earn a return higher than that offered by cash instruments.
- 2. The return of a particular asset class is proportional to its risk over long periods of time (i.e., different asset classes have similar Sharpe
- 3. True diversification goes beyond simple capital allocation and, instead, focuses on risk allocation.
- 4. The main drivers of returns are growth and inflation factors and changes in risk premiums; asset classes will perform differently depending on the particular combination of such factors.

#### **INPRS Allocation**



#### **Performance Attribution**

Lacking a passive market equivalent for the risk parity portfolio, INPRS continues to use the traditional portfolio of 60 percent global equities and 40 percent global bonds ("60/40 portfolio") as a benchmark for long-term return and risk comparisons, despite expectations of significant tracking error. For fiscal year 2016, the risk parity portfolio outperformed a 60/40 portfolio by 0.9 percent. Diversification beyond U.S. equities and bonds was rewarded through periods of volatility in the second half of the fiscal year.

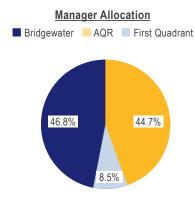
Over the past few years, equity risk concentrated or 60/40 portfolios have benefited from low volatility and high returns within the equity market. However, brief periods of volatility in January and June resulted in an outperformance in risk-balanced risk parity portfolios over a 60/40 portfolio. In particular, the largest contributing factor to performance within a risk parity portfolio over the fiscal year was nominal bonds. Inflation indexed bonds also contributed positively to performance, while equity and commodities were detractors to performance.

#### Market Overview

The first half of fiscal year 2016 was a continuation of fiscal year 2015 - where a low inflationary environment caused losses in commodities and inflation indexed bonds which could not be offset by gains in nominal bonds or equities. As a result, risk parity underperformed a 60/40 portfolio. As inflation began to rise throughout the second half of fiscal year 2016 and Brexit added volatility within equity markets, gains in nominal bonds, inflation indexed bonds, and commodities resulted in outperformance of risk parity over 60/40 portfolios where risk is concentrated within equities.

Based on calculations made by the system's custodian, Bank of New York Mellon, and are time weighted rates of return. <sup>2</sup>Comprised of 60% MSCI ACWI IMI Index (equities) & 40% Barclays Global Aggregate Bond Index (bonds).

#### Portfolio Structure



#### **Target Risk Allocation**

Exposure to asset classes that perform well in the following economic environments



## Historical Comparative Investment Results<sup>1</sup> As of June 30, 2016

#### **Annualized Time-Weighted Rates of Return**

	Percent of Portfolio	1-Year <sup>2,3</sup>	3-Year <sup>2,3</sup>	5-Year <sup>2,3</sup>
Total Consolidated Defined Benefit Assets	100.0 %	1.2 %	4.8 %	4.2 %
vs. BNY Mellon Public Universe Median4		0.8	6.7	6.5
Target Reference Index <sup>5</sup>		1.4	4.6	4.3
Total Domestic Equity	11.8	0.1	9.7	10.6
vs. BNY Mellon Public Universe Median		1.2	10.6	11.3
Russell 3000 Index		2.1	11.1	11.6
Total International Equity	10.4	(8.6)	2.6	1.3
vs. BNY Mellon Public Universe Median		(8.6)	2.8	1.8
MSCI ACWI ex U.S. IMI Net		(9.6)	1.7	0.4
Total Domestic Fixed Income	11.3	10.6	6.4	5.4
vs. BNY Mellon Public Universe Median		5.5	4.2	4.2
Barclays U.S. Aggregate Bond Index		6.0	4.1	3.8
Total International Fixed Income	6.9	8.5	3.8	0.3
vs. BNY Mellon Public Universe Median		1.7	0.4	0.6
Barclays Global Aggregate ex-USD (USDH)		8.5	5.9	5.5

<sup>&#</sup>x27;As the investment objectives and resulting portfolio construction of INPRS may differ from those in the listed peer universes, the most relevant evaluation of INPRS' performance will be against the investment imperatives outlined in the report from the Chief Investment Officer and the cited benchmarks for each asset class.

<sup>&</sup>lt;sup>2</sup>Net of fees

Investment performance is based on calculations made by the system's custodian, Bank of New York Mellon. The 1-year, 3-year, and 5-year performance returns are time-weighted rates of return based on the market rates of return.

<sup>&</sup>lt;sup>4</sup>Universe of Public Funds

<sup>&</sup>lt;sup>6</sup>Benchmark history through December 31, 2011, represents composite returns for the legacy PERF and TRF dynamic policies and have been combined using dynamic market weights each month and are reported under the single Total Consolidated Defined Benefit Assets structure beginning January 1, 2012.

#### Ten-Year Time-Weighted Investment Rates of Return<sup>1</sup> For the Year Ended June 30

(dollars in millions)

		Market Value of Assets	Rate of Return <sup>2</sup>	Actuarial Assumed Rate	
2016	INPRS <sup>3</sup>	\$ 24,775.6	1.2 %	6.75 %	
2015	INPRS	24,629.8	0.0	6.75	
2014	INPRS	24,560.3	13.7	6.75	
2013	INPRS	21,488.7	6.0	6.75	
2012	INPRS	19,708.9	0.7	7.00	
2011	PERF CRIF <sup>4</sup>	15,796.6	20.1	7.00	
	TRF DB Assets <sup>5</sup>	5,984.0	18.2	7.00	
2010	PERF CRIF	13,314.0	13.9	7.25	
	TRF DB Assets	5,073.0	14.8	7.50	
2009	PERF CRIF	11,795.1	(20.6)	7.25	
	TRF DB Assets	4,236.0	(18.0)	7.50	
2008	PERF CRIF	14,851.0	(7.6)	7.25	
	TRF DB Assets	5,252.0	(6.0)	7.50	
2007	PERF CRIF	16,114.3	18.2	7.25	
	TRF DB Assets	5,501.0	17.9	7.50	

<sup>&</sup>lt;sup>1</sup>Returns from 2007 - 2011 presented as previously reported; returns 2012 and thereafter are based on calculations made by the System's custodian, Bank of New York Mellon. All returns are time-weighted rates of return.

<sup>2</sup>Net of fees; 2007 - 2011 reported as gross of fees.

<sup>&</sup>lt;sup>3</sup>INPRS Consolidated Defined Benefit Assets. <sup>4</sup>Public Employees' Retirement Fund Consolidated Retirement Investment Fund.

<sup>&</sup>lt;sup>5</sup>Teachers' Retirement Fund Defined Benefit Assets.

#### Statistical Performance As of June 30, 2016

Statistic	1-Year	3-Years	5-Years	10-Years
Annualized Time-Weighted Rate of Return	1.19 %	4.78 %	4.18 %	3.80 %
Annualized Standard Deviation	5.49	4.67	5.71	9.42
Annualized Sharpe Ratio <sup>1</sup>	0.22	1.01	0.74	0.34
Beta <sup>2</sup>	0.33	0.33	0.40	0.57
Annualized Alpha <sup>3</sup>	(0.22)	0.07	(0.23)	(0.16)
Correlation <sup>2</sup>	0.83	0.79	0.84	0.91

<sup>&</sup>lt;sup>1</sup>Risk Free Proxy is the Citigroup 3 Month Treasury Bill.

#### **Definition of Key Terms:**

**Standard Deviation:** A statistic used to measure the dispersion in a distribution. Dispersion is measured relative to the mean, or average of the distribution. The greater the dispersion, the higher the risk associated with the pattern of observations. One standard deviation describes two-thirds of the observations in a normal or bell-shaped distribution. In an asset allocation context, standard deviation is a conventional proxy for risk or volatility.

**Sharpe Ratio:** Ratio used to measure risk-adjusted performance. The Sharpe Ratio is calculated by subtracting a risk-free rate (proxy) from the rate of return for a portfolio and dividing the result by the standard deviation of the portfolio returns. The Sharpe Ratio provides insight on excess risk held in the portfolio. The greater a portfolio's Sharpe Ratio, the better its risk-adjusted performance has been. A negative Sharpe Ratio indicates that a risk-less asset would perform better than the security being analyzed.

**Beta:** A measure of the volatility, or systematic risk, of a security or portfolio in comparison to the market as a whole. Beta is the tendency of a security's return to respond to swings in the market. A Beta of less than one (1) indicates less volatility than the market. A Beta of greater than one (1) indicates greater volatility than the market.

**Alpha:** A measure of performance on a risk-adjusted basis. Alpha is the difference between the actual performance of the fund and the performance which should have been achieved given the market's performance and the fund's risk posture.

**Correlation:** A Statistical measure of how two (2) securities move in relation to each other. A correlation of positive 1.0 indicates similar magnitude and direction of change. A correlation of negative (1.0) indicates similar magnitude, but opposite direction. A correlation of zero indicates the relationship is purely random. Often, the correlation is squared and known as **R-squared** or the **Coefficient of the Correlation**.

<sup>&</sup>lt;sup>2</sup>Market Proxy is the S&P 500.

<sup>3</sup>Market Proxy is INPRS' Custom Benchmark.

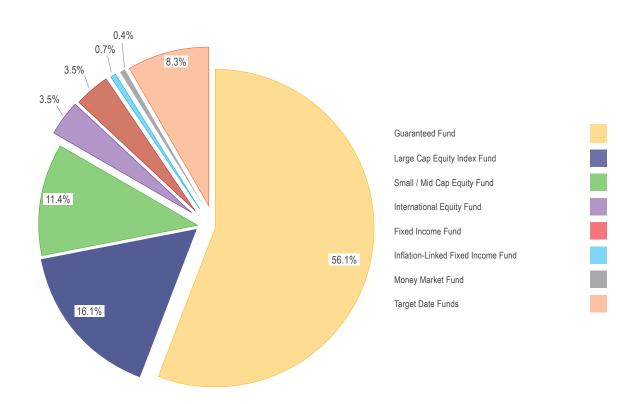
# Investment Results – Annuity Savings Accounts and Legislators' Defined Contribution Plan

**Assets by Investment Option** As of June 30, 2016

(dollars in millions)

Investment Option	ASA & LEDC Plan Assets <sup>1</sup>		Percent of Self-Directed Investments
Guaranteed Fund	\$	2,874.2	56.1 %
Large Cap Equity Index Fund		827.1	16.1
Small / Mid Cap Equity Fund		582.6	11.4
International Equity Fund		181.5	3.5
Fixed Income Fund		177.9	3.5
Inflation-Linked Fixed Income Fund		33.7	0.7
Money Market Fund		23.2	0.4
Stable Value Fund		1.2	-
Target Date Funds <sup>2</sup>		426.0	8.3
Total ASA and LEDC Plan Assets <sup>3</sup>	\$	5,127.4	100.0 %

<sup>&</sup>lt;sup>1</sup>Assets include all PERF, TRF Pre-1996, and TRF 1996 ASA assets and the LEDC Plan account balances allocated outside of the Consolidated Defined Benefit Assets option. <sup>2</sup>Consolidated market values of all Target Date Funds. <sup>3</sup>Includes Investment Receivables, Foreign Exchange Contracts Receivables, Interest and Dividend Receivables, Investment Payables, Foreign Exchange Contracts Payables, and Obligations Under Reverse Repurchase Agreements Repurchase Agreements.



## Investment Results – Annuity Savings Accounts and Legislators' Defined Contribution Plan

Historical Annualized Time-Weighted Rate of Return by Investment Option vs. Benchmark Returns As of June 30, 2016

Investment Option	1-Year <sup>1,2</sup>	3-Year <sup>1,2</sup>	5-Year <sup>1,2</sup>
Guaranteed Fund	0.46 %	0.35 %	0.63 %
Large Cap Equity Index Fund	4.0	11.6	12.1
S&P 500 Index	4.0	11.7	12.1
Small / Mid Cap Equity Fund	(4.8)	8.0	8.8
Russell Small Cap Completeness Index	(5.2)	8.6	9.3
International Equity Fund	(8.9)	2.4	0.9
MSCI ACWI ex US Index	(10.2)	1.2	0.1
Fixed Income Fund	5.4	4.0	4.1
Barclays U.S. Aggregate Bond Index	6.0	4.1	3.8
Inflation-Linked Fixed Income Fund	3.6	2.0	2.5
Barclays U.S. TIPS Index	4.4	2.3	2.6
Money Market Fund	0.3	0.2	0.1
Citigroup 3 Month T-Bill Index	0.1	0.1	0.1
Stable Value Fund <sup>3</sup>	1.4	2.2	2.5
Citigroup 3 Month T-Bill Index	0.1	0.1	0.1
Target Date Funds <sup>4</sup> :			
Retirement Fund	3.0	3.3	3.5
Retirement Fund Index	3.1	2.8	2.7
Retirement Fund 2020	2.5	4.2	4.1
2020 Fund Index	2.7	3.9	3.7
Retirement Fund 2025	2.2	4.9	4.6
2025 Fund Index	2.3	4.6	4.3
Retirement Fund 2030	1.1	5.5	5.0
2030 Fund Index	1.1	5.3	4.8
Retirement Fund 2035	(0.7)	5.7	5.2
2035 Fund Index	(1.0)	5.3	4.9
Retirement Fund 2040	(1.2)	5.6	5.2
2040 Fund Index	(1.6)	5.2	4.8
Retirement Fund 2045	(1.1)	5.6	5.2
2045 Fund Index	(1.6)	5.2	4.8
Retirement Fund 2050	(1.1)	5.6	5.2
2050 Fund Index	(1.6)	5.2	4.8
Retirement Fund 2055	(1.1)	5.6	5.2
2055 Fund Index	(1.6)	5.2	4.8
Retirement Fund 2060	(1.1)	5.7	5.5
2060 Fund Index	(1.6)	5.2	4.9

<sup>&</sup>lt;sup>1</sup>Return net of fees

<sup>&</sup>lt;sup>2</sup>Based on performance calculations made by the system's record keeper, Xerox. The 1-year, 3-year, and 5-year performance returns are time-weighted rates of return for the fiscal year ended June 30, 2016. Prior to July 30, 2010, all data presented (excluding the Guaranteed Fund) is calculated from manager composite performance. After July 30, 2010, all performance presented consists of actual investment returns experienced by members

<sup>&</sup>lt;sup>3</sup>Investment Fund Option in the Legislators' Defined Contribution Plan and Public Employees' Retirement Fund ASA Only Plan.

<sup>&</sup>lt;sup>4</sup>Target Date Fund benchmarks are comprised of performance data using a passive strategy with the same asset allocation of each Target Date Fund.

## Investment Results – Annuity Savings Accounts and Legislators' Defined Contribution Plan

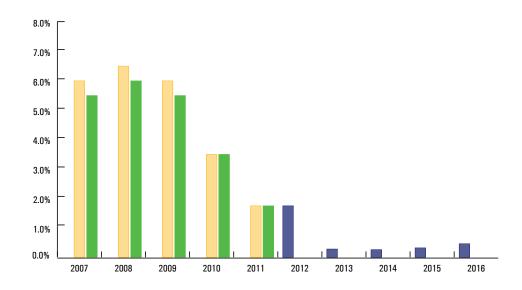
Annuity Savings Accounts Ten-Year Guaranteed Fund Interest Crediting Rates For the Year Ended June 30

Interest Credit Rate

	Interest orealt Nate		
	INPRS	PERF	TRF
2016	0.46 %	N/A	N/A
2015	0.32	N/A	N/A
2014	0.26	N/A	N/A
2013	0.28	N/A	N/A
2012¹	1.75	N/A	N/A
2011	N/A	1.75 %	1.75 %
2010	N/A	3.50	3.50
2009	N/A	6.00	5.50
2008	N/A	6.50	6.00
2007	N/A	6.00	5.50

<sup>&</sup>lt;sup>1</sup>Guaranteed Fund assets of PERF, TRF Pre-1996 and TRF 1996 were unitized as of January 1, 2012.





#### Largest Assets Held as of June 30, 2016 Top Ten Equity Holdings by Fair Value<sup>1</sup>

#### (dollars in thousands)

Company	Shares	Fa	ir Value
Microsoft Corp.	1,221,812	\$	62,520
Nestle SA	726,560		56,047
Apple Inc.	535,521		51,196
Exxon Mobil Corp.	398,410		37,347
Alphabet Inc. Class C Capital Stock	51,203		35,438
Visa Inc.	472,287		35,030
Taiwan Semiconductor Manufacturing	6,620,494		33,350
Alphabet Inc. Class A Common Stock	46,471		32,694
Johnson & Johnson	266,816		32,365
Allergan PLC	136,764		31,605

<sup>&</sup>lt;sup>1</sup>A complete list of portfolio holdings is available upon request.

#### Largest Assets Held as of June 30, 2016 Top Ten Fixed Income Holdings by Fair Value<sup>1</sup>

#### (dollars in thousands)

Description	Coupon Rate	Maturity Date	Par Value	Fair Value
U.S. Treasury - CPI Inflation Index Bond	2.125 %	2/15/41	\$ 159,575	\$ 210,504
U.S. Treasury - CPI Inflation Index Bond	1.375	2/15/44	158,407	183,119
U.S. Treasury - CPI Inflation Index Bond	0.750	2/15/45	157,806	158,478
U.S. Treasury Bond	2.500	2/15/46	149,440	155,610
U.S. Treasury - CPI Inflation Index Bond	0.750	2/15/42	154,343	154,646
U.S. Treasury - CPI Inflation Index Bond	0.625	2/15/43	155,922	151,762
U.S. Treasury Note	1.000	5/31/18	147,860	149,004
U.S. Treasury - CPI Inflation Index Bond	2.125	2/15/40	101,076	132,140
U.S. Treasury Note	0.375	10/31/16	113,240	113,248
U.S. Treasury - CPI Inflation Index Bond	1.000	2/15/46	94,424	101,938

<sup>&</sup>lt;sup>1</sup>A complete list of portfolio holdings is available upon request.

### Top Ten Brokers' Commission Fees For the Year Ended June 30, 2016

#### (dollars in thousands)

Broker	 Amount Paid in Fees	
Morgan Stanley & Co. Inc.	\$ 674	
Goldman Sachs & Co.	523	
Newedge USA LLC	433	
Investment Technology Group, New York	127	
Credit Suisse, New York	118	
UBS Securities LLC	118	
Jeffries & Co. Inc., New York	116	
Merrill Lynch International	110	
Instinet Europe Limited, London	103	
JP Morgan Secs Ltd, London	66	
Top Ten Brokers' Commission Fees	 2,388	
Other Brokers	 1,799	
Total Brokers' Commission Fees	\$ 4,187	

### **Investment Management Fees** For the Year Ended June 30, 2016

#### (dollars in thousands)

Asset Class	Investment Management Fees	
Consolidated Defined Benefit Assets		
Public Equity	\$	16,190
Private Equity		42,110
Fixed Income – Ex Inflation-Linked		10,654
Fixed Income – Inflation-Linked		3,374
Commodities		7,263
Real Estate		16,785
Absolute Return		51,912
Risk Parity		7,909
Cash + Cash Overlay		100
Total Consolidated Defined Benefit Assets		156,297
Special Death Benefit Fund Assets		8
Annuity Savings Accounts Assets		4,260
Total Investment Management Fees	\$	160,565

#### Investment Professionals

#### **Consolidated Defined Benefit Assets**

#### Custodian

Bank of New York Mellon

#### Consultants

Aksia (Absolute Return) Mercer (Real Estate)

Verus (General: Defined Benefit)
Torrey Cove (Private Equity)

#### **Public Equity**

Altrinsic Global Advisors, LLC

Arrowstreet Capital, LP

Artisan Partners Limited Partnership

Baillie Gifford & Company
BlackRock Institutional Trust
Jackson Square Partners
Disciplined Growth Investors
Leading Edge Investment Advisors

Rhumbline Advisers

Schroders

Times Square Capital Management, LLC

#### **Private Equity**

A.M. Pappas & Associates, LLC

ABRY Partners
Accel Partners

Accent Equity Partners AB

**Actis Capital** 

Advanced Technology Ventures

Advent International Global Private Equity

Aisling Capital

AlpInvest US Holdings, Inc.

American Securities Capital Partners, L.P.

AnaCap Financial Partners LLP

Apax Partners, Inc Apollo Management, L.P. ARCH Venture Partners Ares Management

Austin Ventures

Arle Capital Partners

Avenue Capital Group, LLC Bain Capital Partners

Baring Private Equity Asia Limited

Bay Partners

Bertram Capital

Black Diamond Capital Management, LLC

Brentwood Associates Caltius Mezzanine Cardinal Partners Catterton Partners

Centerfield Capital Partners Century Park Capital Partners Cerberus Capital Management Charterhouse Capital Partners

CID Capital Cinven Limited Clarity China

Close Brothers Private Equity, Ltd. Code Hennessy & Simmons LLC

Coller Capital

Columbia Capital LLC

Court Square Capital Partners Crescent Capital Partners Crestview Capital Funds CVC Capital Partners Doll Capital Management

Elevation Partners
EnCap Investments
Energy Capital Partners
Enhanced Capital Partners
Escalate Capital Partners
Falcon Investment Advisors, LLC

First Reserve Corporation Forbion Capital Partners Fortress Investment Group LLC

Gilde Buyout Partners Globespan Capital Partners GSO Capital Opportunities GTCR Golder Rauner, LLC H2 Equity Partners BV

Hammond Kennedy Whitney & Co

Hellman & Friedman LLC

Herkules Capital

**High Road Capital Partners** 

Horsley Bridge

Insight Venture Partners
Institutional Venture Partners

#### Investment Professionals, continued

#### **Consolidated Defined Benefit Assets**

#### Private Equity, cont.

JFM Management Inc.

Khosla Ventures

**KPS Special Situations Funds** 

Landmark Partners, Inc.

Leonard Green & Partners

Lexington Partners Inc.

Lightyear Capital LLC

Lindsay Goldberg

Lion Capital

**MBK Partners** 

Merit Capital Partners

Mill Road Capital

Neuberger Berman

**New Enterprise Associates** 

New Mountain Capital LLC

NGP Energy Capital Management

Oak Hill Advisors, L.P.

Oak Hill Capital Management, Inc.

Oak Investment Partners

Oaktree Capital Management, LLC

**Opus Capital Venture Partners** 

Panda Power Funds

Parthenon Capital

Peninsula Capital Partners LLC

Permira Advisers Limited

Platinum Equity, LLC

Rho Capital Partners, Inc.

**RJD Partners Limited** 

SAIF Management II Ltd

Sankaty Advisors

Scale Venture Partners

Silver Cup

Silver Lake Partners

Stepstone

Sumeru Equity Partners

Sun Capital Partners

TA Associates

**Technology Crossover Ventures** 

**Technology Partners** 

Terra Firma Capital Partners

The Blackstone Group

The Jordan Company (TJC)

TowerBrook Investors

TPG Capital

**Trilantic Capital Partners** 

**Trinity Ventures** 

Triton

True Ventures

TSG Consumer Partners

Veritas Capital Management

Veronis, Suhler & Associates, Inc.

Vestar Capital Partners, Inc.

Vintage Venture Partners

Vision Capital LLP

Vista Equity Partners

Walden Group of Venture Capital Funds

Warburg Pincus

Warwick Energy Investment Group

Wayzata Investment Partners, LLC

Weston Presidio Capital

White Deer Energy

Windjammer Capital Investors

WLR Recovery Partners

Xenon Private Equity

York Capital Management

#### Fixed Income - Ex Inflation Linked

Goldman Sachs Asset Management, LP

Income Research + Management

Oak Hill Advisors, LP

Oak Tree Capital Management, LP

Pacific Investment Management Company (PIMCO)

Reams Asset Management

State Street Global Advisors

Stone Harbor

**TCW** 

Wellington

#### Fixed Income - Inflation Linked

BlackRock Financial Management

Bridgewater Associates, Inc.

Northern Trust Global Investments

#### **Commodities**

CoreCommodity Management

Goldman Sachs Asset Management, LP

Gresham Investment Management, LLC

#### Investment Professionals, continued

#### **Consolidated Defined Benefit Assets**

#### **Real Estate**

Abacus Capital Group, LLC

BlackRock Financial Management

Blackstone Property Partners

Blackstone Real Estate Partners

Colony Capital, LLC

Exeter Property Group, LLC

Greenfield Partners, LLC

H/2 Capital Partners

Harrison Street Real Estate Capital, LLC

House Investments

JDM Partners

LaSalle Investment Management

Lone Star Funds

Mesa West Capital

Prima Capital Advisors, LLC

Related Fund Management LLC

Rockpoint Group LLC

Stockbridge Capital Group

TA Realty Associates

Walton Street Capital, LLC

WestRiver Capital, LLC

#### **Absolute Return**

AQR Capital Management

Aeolus Capital Management

Black River Asset Management

Blackstone Alternative Asset Management (BAAM)

Blackstone Tactical Opportunities Advisors

**Brevan Howard Asset Management** 

Bridgewater Associates, Inc.

**Davidson Kempner Capital Management** 

D.E. Shaw Multi-Asset Manager

Emerging Sovereign Group

Highfields Capital Management

Ionic Capital Management

Kepos Capital

King Street Capital Management

MKP Capital Management

Nephila Capital

Oceanwood Capital Management

Oxford Asset Management

Pacific Alternative Asset Management

Company (PAAMCO)

Perella Weinberg Partners

Pharo Global Advisors

Tilden Park Associates

Two Sigma Advisers

#### **Risk Parity**

AQR Capital Management Bridgewater Associates, Inc

First Quadrant

#### Cash Overlay

Russell Investments

#### Investment Professionals, continued

#### **Annuity Savings Account & Legislators' Defined Contribution Plan Assets**

Public Employees' Retirement Fund (PERF)

Teachers' Retirement Fund Pre-1996 Account (TRF Pre-1996)

Teachers' Retirement Fund 1996 Account (TRF 1996)

Legislators' Defined Contribution Plan (LEDC Plan)

#### Consultant

Cap Cities (General: Defined Contribution)

#### **Large Cap Equity Index Fund**

BlackRock Institutional Trust

#### **Small/Mid Cap Equity Fund**

Rhumbline Advisers

Times Square Capital Management, LLC

#### **International Equity Fund**

Altrinsic Global Advisors, LLC Arrowstreet Capital, LP Baillie Gifford & Company BlackRock Institutional Trust

#### **Fixed Income Fund**

Loomis Sayles & Company Northern Trust Global Investments Pacific Investment Management Company (PIMCO)

#### Inflation-Linked Fixed Income Fund

BlackRock Institutional Trust

#### **Money Market Fund**

Bank of New York Mellon

#### **Guaranteed Fund**

Logan Circle Reams Asset Management State Street Global Advisors

#### Stable Value Fund (PERF ASA

Only & Legislators' Plans only) Galliard Capital Management

#### **Pension Relief Fund**

Bank of New York Mellon

#### **Special Death Funds**

BlackRock Financial Management